CLAIMS

1. A method implemented in a computer program application
performing operations on documents having states, the method
comprising:
    maintaining in a memory a state history of a document
for storing document states; and
    whenever an interesting operation has occurred,
automatically capturing the state of the document as it
exists after the operation and adding the captured state to
the state history.

2. The method of claim 1, wherein the memory comprises a
disk file.

3. The method of claim 1, wherein:
    the state history includes states of the document and
the order in which the stored states were automatically
added to the state history;
    the state history is displayed to a user as a list of
document states shown in their stored order;
    an operation is classified as an interesting operation
if it changes the state of the document;
    a state is added to the state history only if the
operation creating the state is classified as an interesting
operation and not otherwise;
    performing a step backward operation by installing as
the current state of the document a state stored in the
state history, whereby all step backward operations place
the document in a state that occurred immediately after an

- 20 -

16 interesting operation;

17 performing a step forward operation by installing as

18 the current state of the document a state stored in the

19 state history, whereby all step forward operations place the

20 document in a state that occurred immediately after an

21 interesting operation;

22 4. The method of claim 3, wherein:

23 the list of document states displayed to the user

24 comprises a list of items, each item representing a state of

25 the document that existed after an interesting operation and

26 that can be recovered with a step backward operation in the

27 application; and

28 the list of document states displayed to the user

29 comprises a list of items, each item representing a state of

30 the document that existed after an interesting operation and

31 that can be recovered directly by selecting the item.

1 5. The method of claim 4, wherein:

2 the application is digital graphics program operable to

3 create and revise images in digital form;

4 the application provides a tool operable under user

5 control to obtain source material from any state in the

6 state history and apply it to a current state of the

7 document; and

8 the images are raster images.

6. The method of claim 4, wherein:

the application enables a user to select any item in the displayed list of items and cause the application to create a new document having the document state corresponding to the selected item.

7. The method of claim 4, wherein:

each of the captured states in the state history maintains the state data in essentially its original form, whereby the captured state data is suitable for immediate use in other operations.

8. A method for enabling a user to undo revisions made to a document, the method comprising:

maintaining a first history of interesting operations and a second history of all operations requested by a user, the second history but not the first history including operations global to the state of the application.

9. A computer-implemented method of interacting with a user editing a document in a computer program application, the document having a document state, the method comprising:

receiving from the user a sequence of commands to change the document;

changing the document state in response to each command;

adding the changed document state to a state history maintained in a computer-readable memory device each time the document state is changed;

for each document state added to the state history,

12   adding a corresponding entry to a history list displayed to

13   the user on a computer-controlled display device operated as

14   part of a graphical user interface; and

15   in response to a user action stepping backward to an

16   item in the history list, updating the document to have the

17   corresponding document state saved in the state history.

10.   The method of claim 9, wherein:

       the state history and the history list are limited to

storing a preset number of items and excess items are

scrolled off the top of the list as new items are added.

11.   The method of claim 9, wherein:

       the state history is stored in a region of memory and

the oldest document states in the state history are

discarded when free space in the region runs low.

12.   The method of claim 11, wherein:

       the oldest document states are found and discarded by a

memory management process.

13.   The method of claim 9, wherein:

       a command to change the document that comes after a

step backward command to a selected item in the history list

causes the items after the selected item to be deleted from

the history list and the corresponding document states to be

deleted from the state history.

14. The method of claim 9, wherein:

a command to change the document that comes after a step backward command to a selected item in the history list does not cause the items after the selected item to be deleted from the history list and adds a new item to the end of the history list and a new document state to the state history.

15. The method of claim 9, further comprising:

enabling a user interface gesture on the history list to create a new document from a document state from the state history.

16. A method implemented in a computer program application operable to create and edit a document, comprising:

keeping a history list;

going back to a previous state in the history list;

selecting a future state from the history list, being a state created after the previous state, as a source of data for an operation; and

performing the operation with the future data on the previous state.

17. A method implemented in a computer program application operable to create and edit a document, comprising:

keeping a history of document states created by a user;

enabling the user to discard any of the history; and

enabling the user to step backward and forward through the history and thereby to alter the state of the document to be any of the document states in the history.

8   18.   A method implemented in a document-processing computer

9   program application, the method comprising:

10   keeping a history of document states created

11   automatically whenever a user command to the application

12   changes the state of a document;

13   enabling the user to discard any user-selected set of

14   the document states in the history; and

15   enabling the user to designate any one of the document

16   states in the history and thereby install the designated

17   state as the current state of the document.

1   19.   The method of claim 18, further comprising:

         saving the history when the document is closed on a

long-term storage medium, whereby the history may be

restored when the document is later opened and across

invocations of the application.

1   20.   The method of claim 19, wherein:

         the saved history resides in the document with final

document data.

1   21.   The method of claim 19, wherein:

2   the saved history resides in a long-term data

3   repository independent of the original document.

22.   A method enabling a user to control operation of a
computer program application for creating and modifying a
document, the method comprising:

      identifying for the user on a display device a set of
states that the document has been in by operation of the
application; and

      enabling the user to designate any arbitrary one of the
identified states.

23.   The method of claim 22, further comprising:
      displaying the document in a user interface window, the
document being a digital image.

24.   The method of claim 23, wherein the digital image has a
plurality of layers, each of the plurality of layers having
a plurality of channels, the method further comprising:
      displaying user-interface elements for applying filters
to the digital image.

25.   The method of claim 22, further comprising:
      installing the designated state as the current state of
the document in response to a user command.

26.   The method of claim 22, further comprising:
      providing the user an editing tool having the
designated state as a document state operand.

27.   The method of claim 22, further comprising:
      providing the user an delete tool for deleting the
designated state from the set of states.

- 26 -

28. The method of claim 22, wherein:

the set of states is identified by displaying a scrollable list of elements each identifying one of the states in the set.

29. The method of claim 28, wherein the list elements are ordered by the time the corresponding states were created.

30. The method of claim 25, wherein the designation and installation are performed in response to a single command.

31. The method of claim 25, wherein the set of states is displayed in an order, the method further comprising:

enabling the user to make a gesture on a user interface indicating a sequence of displayed state identifiers and responding to the gesture by displaying the document in the states indicated as the gesture is made.

32. The method of claim 25, further comprising:

enabling the user to modify the document state after the installing step; and

adding the document state resulting from the modification to the set of states identified on the display device.

33. The method of claim 31, wherein the set of states is displayed in order of creation of the states in the set.

34. The method of claim 31, wherein the document is a digital image.

-27-

35. The method of claim 24, further comprising:

    providing a step backward and a step forward command for the user to execute to navigate the set of states; and

    providing a separate undo and redo command for the user to undo and redo commands entered by the user.

36. The method of claim 25, further comprising:

    providing a step backward and a step forward command for the user to execute to navigate the set of states; and

    providing a separate undo and redo command for the user to undo and redo commands entered by the user.

37. Apparatus comprising a computer-readable storage medium tangibly embodying program instructions defining a computer program application for performing operations on documents having states, the program comprising instructions operable for causing a programmable processor to:

    maintain in a memory a state history of a document for storing document states; and

    whenever an interesting operation has occurred, automatically capture the state of the document as it exists after the operation and adding the captured state to the state history.

38. Apparatus comprising a computer-readable storage medium tangibly embodying program instructions for use by a user of a program to undo revisions made to a document, the apparatus comprising instructions operable for causing a programmable processor to:

    maintain a first history of interesting operations and

a second history of all operations requested by a user, the
second history but not the first history including
operations global to the state of the application.

39. Apparatus comprising a computer-readable storage medium
tangibly embodying program instructions for interacting with
a user editing a document in a computer program application,
the document having a document state, the apparatus
comprising instructions operable for causing a programmable
processor to:
    receive from the user a sequence of commands to change
the document;
    change the document state in response to each command;
    add the changed document state to a state history
maintained in a computer-readable memory device each time
the document state is changed;
    for each document state added to the state history, add
a corresponding entry to a history list displayed to the
user on a computer-controlled display device operated as
part of a graphical user interface; and
    in response to a user action stepping backward to an
item in the history list, update the document to have the
corresponding document state saved in the state history.

40. A computer program, residing on a computer-readable
medium, comprising instructions for causing a computer to:
    keep a history list;
    go back to a previous state in the history list;
    select a future state from the history list, being a
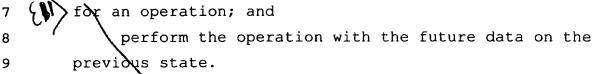state created after the previous state, as a source of data

7 for an operation; and

8   perform the operation with the future data on the

9 previous state.

1 41. A computer program, residing on a computer-readable

2 medium, comprising instructions for causing a computer to:

3   keep a history of document states created by a user;

4   enable the user to discard any of the history; and

5   enable the user to step backward and forward through

6 the history and thereby to alter the state of the document

7 to be any of the document states in the history.

42. A computer program, residing on a computer-readable

medium, comprising instructions for causing a computer to:

     keep a history of document states created automatically

whenever a user command to the application changes the state

of a document;

     enable the user to discard any user-selected set of the

document states in the history; and

     enable the user to designate any one of the document

states in the history and thereby install the designated

state as the current state of the document.

43.   A computer program, residing on a computer-readable
medium, comprising instructions for causing a computer to:
       create and modify a document;
       identify for a user on a display device a set of states
that the document has been in by operation of the
application; and
       enable the user to designate any arbitrary one of the
identified states.